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Research Article

Driving Quality Improvement in Healthcare: Analyzing the Effectiveness of CBAHI Ac-creditation on Efficiency Rates and Patient Safety Outcomes measures

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ABSTRACT

Background: To verify whether CBAHI improves healthcare services and health outcomes and could help maximize the program's potential, research on the effectiveness of the CBAHI is therefore required. Therefore, the aim of this study is to compare the impact of CBAHI accredi-tation on efficiency rate and patient safety measures between three hospitals.

Materials/Methods: A retrospective comparative research design was used to conduct this study. Three hospitals in Makkah city that serve various sectors and functions were selected to comprehensively under-stand the accreditation impact. A retrospective chart review and data were collected from the quality man-agement department's database of the included hospitals. To study hospital efficiency rate, collected data about bed occupancy rate, bed turnover rate, aver-age length of stay, and operation room cancellation rate was collected. To study patients' safety measures, data related to rate of medication errors/ 1000 dispensed doses, rate of patient falls, mortality rate, hospital-acquired pressure ulcer, and surgical site infection was collected. Data was collected from January 2016 to March 2020.

Results: It was observed that bed occupancy rate, operation cancellation rate, and length of stay had sta-tistically significant differences during three years after CBAHI accreditation 2017 at hospital A. At hos-pital B the operation cancellation rate, length of stay, and medication error rate had statistically significant differences during three years after CBAHI accreditation 2017. But there were no statistically significant differences related efficiency rate dimensions and patient safety dimensions during the three years after CBAHI accreditation 2017 at hospital C. Moreover, there were statistically significant differences related efficacy dimensions, medica-tion error rate, and hospital-acquired pressure ulcer a year before and a year after obtaining CBAHI 2017 at hospital A. Also, there were statistically significant differences related to bed turnover rate, length of stay, medication error, and hospital-acquired pressure ulcer a year be-fore and a year after obtaining CBAHI 2017 at hospital B. There were statistically significant differences related to length of stay, hospital-acquired pressure ulcer, and surgical site infection a year before and a year after obtaining CBAHI 2017 at hospital C. There were statistically significant differences related to length of stay before and after CBAHI reaccreditation 2020 at hospital A and hospital C. At hospital B, statistically significant differences were observed in medication error, and mortality rate before and after CBAHI reac-creditation 2020. There were statistically significant differences related to surgical site infection before and after CBAHI reaccreditation 2020 at hospital B and hospital C.

Conclusion: Post CBAHI reaccreditation in 2020, varying efficiency and patient safety metrics presented improvements in the three hospitals, while certain metrics revealed deteriorated per-formance. This under-scores that reaccreditation might improve some aspects, but other domains require targeted intervention for enhanced outcomes. It's important to further expand upon these results with a more detailed discussion, considering other influencing factors, literature compar-ison, and suggesting future directions for the study.

INTRODUCTION

Health service organizations worldwide consider accred-itation a strategic tool to enhance the quality of care. Hospital accreditation programs aim to set clinical and organizational standards, assess compliance with those standards, and en-courage and sustain efforts to en-hance quality. Accreditation is commonly implemented through the involvement of nation-al-level accreditation institutions that operate in a minimum of 27 nations (Almasabi & Thomas, 2017).

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processes and internal policies are ex-pected benefits of the accreditation process. Additional-ly, adopting validated and explicit standards to direct care processes may also improve patient safety, par-ticularly when considering well-established metrics like medication errors (Oliveira & Matsuda, 2016 & Mekory et al., 2017).

The primary objective of accreditation is to en-hance the standard of patient care. In this regard, the Institute of Medicine (IOM) and the World Health Or-ganization (WHO) have put up recommendations re-garding the quality dimensions that encompass accept-ability (patient-centeredness), equity, accessibility, effi-cacy, and safety, which serve as indicators for evaluat-ing hospital performance (Shaw, 2003). The efficiency of hospital performance is often assessed through the utilization of key metrics such as bed occupancy rate, turnover interval, and average duration of stay at the hospital level. Such measures are used to improve pro-vided health care which indirectly represents accessibil-ity, the system capacity, and utilization efficiency across the health system level (Mohammadkarim et al., 2011). The bed occupancy rate is a critical indicator used to assess the utilization of healthcare infrastruc-ture. It can be calculated by dividing the number of beds occupied by patients by the total number of avail-able beds, and then multiplying the result by 100 to get a percentage (British Medical Association, 2017). Bed turn-over rate represents the number of patients treated per bed in a defined period, usually 1 year (Aloh ET AL., 2020). Operation cancellation rate was calculated by dividing the number confirmed cases (numerator) by the total number of scheduled cases (denominator) (Ol-son & Dhakal, 2015). Moreover, as hospital-based measures represent overall patient outcome and clinical effectiveness, the gross and net mortality rates are also frequently reported (Dimick, Welch & Birkmeyer, 2004).

According to reasonable evidence, adherence to accrediting standards gives various tenable benefits in improving performance in the hospital setting. Despite contradictory causation data, implementing hospital accreditation systems promotes performance improve-ment and patient safety. Aiming for sustainable per-formance improvements, more efforts should be im-plemented to support and incentivize accreditation (Hussein et al., 2012). According to comprehensive as-sessments of the accreditation's effects in the health sector, it has the greatest positive effect on fostering organizational transformation and professional devel-opment (Brubakk et al., 2015 & Nicklin, 2015).

Many countries have implemented healthcare ac-creditation with varying degrees of success. Many more have done so without sufficient evidence that accredita-tion is the best way to enhance the quality of healthcare services (Jha, 2018). No strong evidence is provided by a review of the literature on the effect of accreditation on quality of care (Terra, & Berssaneti, 2019).

In order to effectively achieve the goals of im-proving patient safety and healthcare quality, it is im-perative to possess a comprehensive comprehension of the inputs, encompassing costs and resource utilization, as well as the outcomes, namely the enhancement of patient safety and quality, within accrediting programs. It is crucial to assess how accreditation affects clinical practice and care quality in order to decide whether the anticipated improvements in quality and safety out-comes justify the increased costs associated with data collection and audit procedures (Australian Commission on Safety and Quality in Health Care, 2011).

Following the Council of Health Services' recom-mendations, the Central Board for Accreditation of Healthcare Institutions (CBAHI) was created in 2005. The CBAHI was established to create and execute qual-ity standards across Saudi Arabian health organizations to enhance healthcare. CBAHI accreditation is manda-tory for all healthcare institutions operating in Saudi Arabia, aiming to improve patient care nationwide. According to the Saudi Council of Health Services di-rective, all public and private institutions in Saudi Ara-bia are required to achieve CBAHI accreditation. De-spite the widespread adoption of accreditation stand-ards over the previous four decades and that patients worldwide are now more likely to receive safe and high-quality healthcare, it is unclear whether accreditation programs improve health organizations, services, or clinical care (Greenfield et al., 2012).

Hospitals have the opportunity to reflect on pa-tient care and operational methods throughout the ac-creditation preparations as well as on an efficient ap-proach to bringing about organizational change (Nick-lin, 2011). Many people have criticized the financial strain it places on hospitals, particularly those in devel-oping countries (Bukonda et al., 2003). This worry is well-founded because hospitals must set aside resources for a lengthy procedure, starting with their initial plans to conduct an accreditation survey and continuing through the accreditation process (Rockwell, Pelletier & Donnelly, 1993). These costs can be divided primarily into two categories. The first entails paying the accredi-tation body's fees, setting up surveys, and acting on survey recommendations. The second category is men-tioned as standards costs and refers to the costs ac-quired by hospitals to meet the relevant standards (Ap-pleyard, & Ramsay, 2008). Therefore, some have em-phasized the necessity of monitoring and evaluating the financial benefit to justify the engagement in accredita-tion (Greenfield & Braithwaite, 2008).

The various benefits and drawbacks of CBAHI's influence on healthcare quality will remain anecdotal and susceptible to political ideology and bias in the ab-sence of an empirically supported evidence basis. To verify whether CBAHI improves healthcare services and health outcomes and could help maximize the pro-gram's potential, research on the effectiveness of the CBAHI is therefore required. Therefore, the aim of this study is to compare the impact of CBAHI accreditation on efficiency rate and patient safety measures between three hospitals.

2. MATERIALS AND METHODS

2.1 Study Design

A retrospective comparative research design was used to conduct this study.

2.2 Study Setting and Participants

In this study three hospitals in Makkah city that serve various sectors and functions were selected to compre-hensively understand the accreditation impact. Hospital A is a tertiary-level specialized hospital in the Ministry of Health. Hospital B is a trauma center and provides tertiary medical care for the city population. Hospital C is a tertiary-level hospital that provides

tertiary care to military patients and the general population.

2.3 Data Collection

Upon receiving approval from senior members of the quality department about factors that reflect both effi-ciency and patients' safety status, Official permission from KAMC IRB was obtained, then a retrospective chart review and data were collected from the quality management department's database of the included hospitals. To study hospital efficiency rate, we collected data about bed occupancy rate, bed turnover rate, av-erage length of stay, and operation room cancellation rate was collected. To study patients' safety measures, data related to rate of medication errors/ 1000 dis-pensed doses, rate of patient falls, mortality rate, hospi-tal-acquired pressure ulcer, and surgical site infection was collected. Data were collected from January 2016 to March 2020 and included 15 months before the ac-creditation and 36 months after the accreditation. This study examines the comparative data from three months prior to and three months following the 2017 accreditation process for three hospitals. Subsequently, an analysis was conducted to compare the performance of three hospitals for a period of three months prior to and three months subsequent to the 2020 certification process. To evaluate reaccreditation's impact on patient safety and efficiency, researchers compared data collected after the facility was initially accredited in 2017 with data collected after it was reaccredited in 2020.

All the data available for the same period was included and any missing data that does not present the status pre and post CBAHI accreditation were excluded from the study. The data of the chosen variable of three dif-ferent level hospitals in Makkah city was collected. These hospitals have a high volume of patient admis-sions per year as they are the main hospitals in the city. The sample size has enough power to deliver significant results. The included hospitals' quality management databases and some patients' electronic files were mined for data, which was then entered into electronic data collection forms that concealed any identifying characteristics. The data was stored in a secure location with restricted access. There were three people involved in the data entering process. After verification, data was transferred to the statistical database directly.

2.3.1 Statistical analysis

The data collected were systematically structured, tabulated, and subjected to statistical analysis using SPSS software (Statistical Package for the Social Sciences, version 26, SPSS Inc., Chica-go, IL, USA). The continuous variables were expressed using the measures of central tendency, specifically the mean and standard deviation. The Mann-Whitney U test was employed to compare differences between two non-parametric variables. The Kruskal-Wallis test was used to compare differences between more than two non-parametric variables. Statistical significance was defined as a p-value less than 0.05.

3. RESULTS

Table 1 illustrates that bed occupancy rate, operation cancellation rate, and length of stay had statistically significant differences during three years after CBAHI accreditation 2017 at hospital A.

Table 2 illustrates that operation cancellation rate, length of stay, and medication error rate had statistically significant differences during three years after CBAHI accreditation 2017 at hospital B.

Table 3 illustrates that there were no statistically significant differences related efficiency rate dimensions and patient safety dimensions during three years after CBAHI accreditation 2017 at hospital C.

Table 4 presents the efficiency and patient safety changes at the three hospitals included in this study before and after obtaining CBAHI accreditation in 2017 using various metrics to measure the performance of these hospitals. There were statistically sig-nificant differences related efficacy dimensions, medication error rate, and hospital-acquired pressure ulcer a year before and a year after obtaining CBAHI 2017 at hospital A. Also, there were statistically significant differences related to bed turnover rate, length of stay, medication error, and hospital-acquired pressure ulcer a year before and a year after obtaining CBAHI 2017 at hospital B. There were statistically significant differ-ences related to length of stay, hospital-acquired pressure ulcer, and surgical site infection a year before and a year after obtain-ing CBAHI 2017 at hospital C.

A comparison of efficiency and patient safety metrics after CBAHI Accreditation in 2017 and reaccreditation in 2020 at Three hospitals is demonstrated in Table 5. The data for hospital A. post reaccreditation in 2020, displayed a significant rise in bed occupancy rate compared to its performance three months after the 2017 accreditation. Further, the bed turnover rate wit-nessed a mild increase. Interestingly, there was a notable decline in the operation cancellation rate by 2020. However, patients' average length of stay extended noticeably during this period. On the patient safety front, the rate of medication errors saw a minor reduction. Hospital-acquired pressure ulcers reported a commendable decrease. Meanwhile, metrics like the rate of patient falls, mortality rate, and surgical site infections remained relatively stable.

According to hospital B data, we found that the efficiency met-rics showed mixed results. The bed occupancy rate experienced a significant drop by 2020, whereas the bed turnover rate mildly decreased. Remarkably, by 2020, the hospital managed to eradi-cate operation cancellations entirely. Additionally, the average length of stay for patients was reduced slightly. In terms of patient safety, there was a reduction in both the rate of medica-tion errors and hospital-acquired pressure ulcers. The rate of patient falls saw a slight increment, and there was a considerable surge in the mortality rate. The hospital maintained a zero rate for surgical site infections across both periods.

The hospital C post-reaccreditation period in 2020 highlighted an increase in the bed occupancy rate. The bed turnover rate saw a significant decline, and a minor decrease was observed in the operation cancellation rate. The average length of stay for pa-tients rose during this period. From a safety perspective, there were nominal changes in the rate of medication errors and pa-tient falls. The hospital witnessed a pronounced increase in the mortality rate. Notably, hospital-acquired pressure ulcers were absent in 2020, but there was a significant increase in surgical site infections.

Table 6 illustrates that there were statistically significant differ-ences related to length of stay before and after CBAHI reaccred-itation 2020 at hospital A and hospital C. At hospital B, statisti-cally significant differences were observed in medication error, and mortality rate before and after CBAHI reaccreditation 2020. There were statistically significant differences related to surgical site infection before and after CBAHI reaccreditation 2020 at hospital B and hospital C.

Table (1): Efficiency rate and patient safety during three years after CBAHI accreditation 2017 at hospi-tal A.

Efficiency rate dimensions	Hospital A			p / χ2
	After a year	After 2 years	After 3 years	
	Mean±SD	Mean±SD	Mean±SD	
Bed occupancy rate	85.5±4.50	89.25±3.49	89.2±2.20	*0.04 / 6.24
Bed turnover rate	2.4±0.18	2.55±0.45	2.62±0.32	4.47/0.11
Operation cancellation rate	11.42±2.5	15.5±2.65	15.5±2.92	**12.76/0.002
Average length of stay	6.16±0.31	6.44±0.67	8.07±0.77	**18.89/0.000
Patient safety dimensions				
Rate of medication errors/1000 dispensed dose	0.16±0.05	0.12±0.05	0.11±0.03	5.51/0.06
Rate of patient falls	0.31±0.28	0.26±0.16	0.22±0.25	1.80/0.41
Mortality rate	3.4±0.00	3.4±0.00	3.4±0.00	0.000/1.00
Hospital-acquired pressure ulcer	0.39±0.25	0.26±0.16	0.22±0.25	5.04/0.08
Surgical site infection	2.23±1.23	1.33±0.41	1.75±0.75	4.02/0.13

P<0.05 / **P<0.01*

Table (2): Efficiency rate and patient safety during three years after CBAHI accreditation 2017 at hospi-tal B.

Efficiency rate dimensions		Hospital B		
	After a year	After 2 years	After 3 years	p / χ2
	Mean±SD	Mean±SD	Mean±SD	
Bed occupancy rate	80.00±4.86	81.33±4.31	73.9±7.68	8.59/0.14
Bed turnover rate	3.35±0.37	3.53±0.43	3.75±0.66	4.21/0.12
Operation cancellation rate	28.5±3.73	10.08±4.48	14.70±8.92	**10.84/0.000
Average length of stay	4.71±0.27	4.48±0.26	4.35±0.23	**10.32/0.006
Patient safety dimensions				
Rate of medication errors/ 1000 dispensed dose	1.01±0.41	0.41±0.21	0.79±0.66	**11.86/0.003
Rate of patient falls	0.16±0.11	0.11±0.15	0.18±0.28	1.52/0.47
Mortality rate	5.79±1.48	5.69±1.08	5.56±0.89	0.04/0.98
Hospital-acquired pressure ulcer	0.69±0.25	0.90±0.52	1.08±0.75	1.72/0.42
Surgical site infection	0.08±0.29	0.09±0.32	0.00±0.00	0.86/0.65

P<0.01**

Table (3): Efficiency rate and patient safety during three years after CBAHI accreditation 2017 at hospital C.

Efficiency rate dimensions	Hospital C			p / χ^2
	After a year	After 2 years	After 3 years	
	Mean±SD	Mean±SD	Mean±SD	
Bed occupancy rate	72.08±12.09	76.32±13.16	76.31±7.15	1.59/0.45
Bed turnover rate	5.26±0.52	5.27±0.58	5.40±0.53	0.33/0.85
Operation cancellation rate	23.9±4.45	23.5±7.29	20.46±5.8	1.67/0.44
Average length of stay	3.19±0.14	3.24±0.26	3.17±0.22	0.59/0.74
Patient safety dimensions				
Rate of medication errors/ 1000 dispensed dose	0.13±0.08	0.14±0.09	0.21±0.07	5.33/0.07
Rate of patient falls	0.32±0.38	0.36±0.24	0.53±0.38	2.48/0.29
Mortality rate	0.76±0.36	0.99±0.28	0.69±0.26	5.09/0.08
Hospital-acquired pressure ulcer	0.03±0.09	0.21±0.30	0.04±0.11	5.05/0.08
Surgical site infection	0.62±0.32	0.72±0.48	1.14±0.64	3.91/0.14

Table (4): Efficiency rate and patient safety a year before and after CBAHI accreditation 2017 at the three studied hospitals

Efficiency rate dimensions	Hospital A		Z / p	Hospital B		Z / p	Hospital C		Z / p
	A year before	A year post		A year before	A year post		A year before	A year post	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD		Mean±SD	Mean±SD	
Bed occupancy rate	81.75±5.03	85.5±4.50	*2.20/0.03	80.00±3.59	80.00±4.86	0.09/0.93	64.26±1.21	72.08±12.09	1.64/0.10
Bed turnover rate	4.27±1.44	2.40±0.18	** 2.83/0.005	3.06±0.26	3.35±0.37	** 2.51/0.01	5.54±0.38	5.26±0.52	1.38/0.16
Operation cancellation rate	9.17±2.52	11.42±2.5	*2.33/0.02	27.83±6.39	28.5±3.73	0.49/0.62	23.45±2.66	23.9±4.45	0.06/0.95
Average length of stay	5.58±0.62	6.16±0.31	** 2.62/0.009	4.91±0.30	4.71±0.27	*2.22/0.03	3.02±0.16	3.19±0.14	** 2.64/0.01
Patient safety dimensions									
Rate of medication errors/ 1000 dispensed dose	0.72±0.43	0.16±0.05	** 3.30/0.001	3.11±1.12	1.01±0.41	** 3.98/0.000	0.09±0.10	0.13±0.08	1.77/0.08
Rate of patient falls	0.38±0.14	0.31±0.28	1.33/0.18	0.18±0.10	0.16±0.11	0.87/0.38	0.43±0.23	0.32±0.38	1.34/0.18
Mortality rate	3.4±0.00	3.4±0.00	0.00/1.00	5.74±0.86	5.79±1.48	0.52/0.60	0.77±0.31	0.76±0.36	0.14/0.88
Hospital-acquired pressure ulcer	1.13±0.69	0.39±0.25	** 3.06/0.002	1.53±0.60	0.69±0.25	** 3.52/0.000	0.28±0.33	0.03±0.09	** 2.65/0.008
Surgical site infection	2.59±1.03	2.23±1.23	0.75/0.45	0.23±0.56	0.08±0.29	0.70/0.48	0.32±0.18	0.62±0.32	** 2.66/0.008

P<0.05 / **P<0.01*

Table (5) Efficiency rate and patient safety after CBAHI accreditation 2017 and after CBAHI reaccreditation 2020 at the three studied hospitals

Efficiency rate dimensions	Hospital A		Z / p	Hospital B		Z / p	Hospital C		Z / p
	months 3 after CBAHI 2017	months af- 3 ter CBAHI 2020		months 3 after CBAHI 2017	months 3 after CBAHI 2020		months af- 3 ter CBAHI 2017	months 3 after CBAHI 2020	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD		Mean±SD	Mean±SD	
Bed occupancy rate	79.67±4.04	87.67±3.21	1.77/0.08	81.00±3.46	52.67±7.77	1.99/0.10	61.47±7.84	70.30±0.00	0.70/0.70
Bed turnover rate	2.20±0.10	2.70±0.20	1.96/0.05	3.12±0.15	2.54±0.56	1.96/0.10	5.10±0.95	3.52±0.02	1.96/0.10
Operation cancellation rate	13.67±2.31	5.33±5.51	1.80/0.07	31.00±2.65	0.00±0.00	2.09/0.10	20.88±2.81	19.18±0.47	0.65/0.70
Average length of stay	5.95±0.33	8.23±0.96	1.96/0.05	5.00±0.16	4.77±0.50	0.44/0.70	3.10±0.17	3.94±0.01	2.02/0.10
Patient safety dimensions									
Rate of medication errors/ 1000 dispensed dose	0.14±0.06	0.12±0.03	0.22/0.82	1.14±0.59	0.86±0.32	0.65/0.70	0.17±0.08	0.14±0.00	0.71/0.70
Rate of patient falls	0.09±0.16	0.06±0.10	0.26/0.80	0.13±0.11	0.27±0.10	1.09/0.40	0.22±0.19	0.93±0.00	2.09/0.10
Mortality rate	3.40±0.00	3.40±0.00	0.00/1.00	5.70±0.62	9.60±1.14	1.96/0.10	0.69±0.57	2.39±0.14	1.96/0.10
Hospital-acquired pressure ulcer	0.38±0.21	0.06±0.10	1.99/0.05	0.95±0.26	0.72±0.36	1.09/0.40	0.10±0.17	0.00±0.00	1.00/0.70
Surgical site infection	2.60±1.67	2.20±0.44	0.22/0.83	0.00±0.00	0.00±0.00	0.00/1.00	0.41±0.36	1.40±0.00	2.09/0.10

Table (6) Efficiency rate and patient safety before and after CBAHI reaccreditation 2020 at the three studied hospitals

Efficiency rate dimensions	Hospital A		Z / p	Hospital B		Z / p	Hospital C		Z / p
	months be- 3 fore CBAHI 2020	months 3 after CBAHI 2020		months be- 3 fore CBAHI 2020	months 3 after CBAHI 2020		months be- 3 fore CBAHI 2020	months 3 after CBAHI 2020	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD		Mean±SD	Mean±SD	
Bed occupancy rate	88.00±1.00	87.67±3.21	1.96/0.05	73.67±4.93	52.67±7.77	1.96/0.05	76.77±5.60	70.30±0.00	1.55/0.21
Bed turnover rate	2.90±0.10	2.70±0.20	1.96/0.05	3.76±0.04	2.54±0.56	1.96/0.05	4.53±1.24	3.52±0.02	0.66/0.51
Operation cancellation rate	12.00±1.00	5.33±5.51	1.96/0.05	11.67±3.79	0.00±0.00	1.09/0.28	21.70±5.55	19.18±0.47	0.66/0.51
Average length of stay	8.15±0.66	8.23±0.96	*1.99/0.04	4.37±0.23	4.77±0.50	1.96/0.05	3.37±0.06	3.94±0.01	*2.02/0.04
Patient safety dimensions									
Rate of medication errors/ 1000 dispensed dose	0.13±0.03	0.12±0.03	1.32/0.18	0.98±0.26	0.86±0.32	*1.99/0.04	0.19±0.06	0.14±0.00	1.55/0.21
Rate of patient falls	0.04±0.07	0.06±0.10	1.15/0.25	0.38±0.49	0.27±0.1	1.16/0.25	0.42±0.47	0.93±0.00	1.55/0.21
Mortality rate	3.40±0.00	3.40±0.00	0.70/0.49	5.67±0.25	9.60±1.14	*2.09/0.04	1.76±1.65	2.39±0.14	0.66/0.51
Hospital-acquired pressure ulcer	0.04±0.07	0.06±0.10	1.00/0.32	0.38±0.41	0.72±0.36	1.16/0.25	0.00±0.00	0.00±0.00	0.00/1.00
Surgical site infection	1.70±0.46	2.20±0.44	0.87/0.38	0.00±0.00	0.00±0.00	*2.09/0.04	2.03±0.25	1.40±0.00	*2.09/0.04

P<0*

4. DISCUSSION

Results from earlier studies on the effects of healthcare accreditation show inconsistent results (Latief, Nurhai-dah, & TikaRianty, 2015). As a result, there has been a strong request in the healthcare literature to study these external accrediting systems to objectively assess their effectiveness (Groene, Kringos & Sunol, 2014). Alt-hough Saudi Arabia is starting the CBAHI accreditation process to support quality improvement in healthcare organizations, there isn't enough evidence to show that it's the best use of resources for improving quality pro-cesses and outcomes. This is due to the lack of progress in the study of its effects. Policymakers and hospital management now face a legitimacy issue. A lack of awareness of the CBAHI accreditation program is ex-acerbated by the lack of study on the subject. A various benefits and drawbacks of CBAHI's influence on healthcare quality will remain anecdotal and susceptible to political ideology and bias in the absence of an em-pirically supported evidence basis (Almasabi & Thom-as, 2017).

The result of this study revealed that there were statisti-cally significant differences related to most of efficacy rate and patient safety dimensions at the three studied hospitals before and after accreditation 2017. This re-sult is in line with who Araujo 2020 who systematically review the impact of hospital accreditation on healthcare quality dimensions and concluded that ac-creditation may have a positive impact on efficiency, safety, effectiveness, patient-centeredness, and timeli-ness dimensions. These results converse with the study of Almasabi 2017 who demonstrate that despite certain procedure changes, CBAHI accreditation did not en-hance patients' outcomes. It also disagreed with Merkow et al., 2014 who found that the performance of accredited centers was found to be satisfactory in rela-tion to most process metrics, while there were notable deficiencies in terms of outcome measurements.

Findings of the study indicated that there were no statis-tically significant differences related to mortality rate before and after CBAHI accreditation 2017 at the three studied hospitals. This may be because surveys only capture moments in time or lack of specific focus on mortality rate improvement and accreditation programs often encompass a broader range of quality improve-ment initiatives, making it less likely to observe statisti-cally significant differences in mortality rates alone. Compliance with standards may be reduced as a result of the lengthy gaps between them. As a result, activities related to clinical performance or accreditation stand-ards may experience peaks and troughs that correspond to the accreditation survey. It was reported by Towers 2014 that Hospitals, on average, undergo changes in risk-adjusted mortality that occur in close temporal proximity to accreditation site visits. These findings dis-agreed with the study of Barnett who revealed that the mortality rate of patients admitted to hospitals during survey weeks is much lower compared to those admitted during non-survey weeks, with a notable, 2017 dif-ference observed in large teaching hospitals.

No statistically significant differences were detected between the three hospitals before and after CBAHI accreditation in 2017 and after CBAHI reaccreditation in 2020 with regard to efficiency rate dimensions and patient safety dimensions. This may be related to Con-sistency in accreditation standards and the three hospi-tals successfully implemented the necessary changes and improvements required for CBAHI accreditation in 2017. As a result, there were no significant differences observed in efficiency rate dimensions and patient safe-ty dimensions after reaccreditation in 2020, indicating that the hospitals maintained their performance levels.

The current study findings demonstrate that the hospital acquired pressure ulcer rate was decreased after CBAHI accreditation 2017 at the three studied hospitals. This may be due to CBAHI accreditation promotes the im-plementation of standardized protocols and guidelines for patient care and accreditation programs that often emphasize the importance of monitoring and reporting adverse events, including hospital-acquired pressure ulcers. This result is consistent with Janati et al.,2016 who reported that following the implementation of the accreditation, the indicators related with pressure ulcers decreased significantly.

Moreover, Surgical site infection after CBAHI accredi-tation 2017 was increased at the hospital C compared with hospital B compared and hospital A. It can be at-tributed to differences in the patient population or vari-ations in the types of surgical procedures performed at each hospital or variation in adherence to infection con-trol protocols. In the same context the study of Janati et al., 2016 concluded that hospital infection unexpected-ly showed a significant increase after implementation of the accreditation. In contrast Alkhenizan, 2011 demon-strated that hospital infection decreases due to imple-mentation of the accreditation.

Findings of this study reported that average length of stay after CBAHI accreditation 2017 was decreased at hospital B compared with hospital A. This may be due to improved operational processes and increased effi-ciency in patient management at hospital B or imple-mentation of better clinical practices, leading to im-proved patient outcomes and shorter hospital stays or provision of multidisciplinary intervention with the in-volvement of caregivers during patients' hospitalizations at hospital B. This result is congruent by the study of Al-Sughayir, 2016 and Janati et al. 2016 and Falstie et al., 2015 who reported that the average hospital stay showed a significant decrease after accreditation.

It was found that there are no statistically significant differences related bed occupancy rate, bed turnover rate, operation

cancellation rate, rate of patient falls, and hospital acquired pressure ulcer before and after reaccreditation 2020. This may be because that the hospitals already deliver high quality care, or the hospi-tals maintained consistent protocols and performance in these areas regardless of their accreditation status. Another cause is that traditional certification is what is used for CBAHI standards, and it places an emphasis on structural analysis evaluation.

5. Conclusion

Post CBAHI reaccreditation in 2020, varying efficiency and patient safety metrics presented improvements in the three hospitals, while certain metrics revealed deteri-orated performance. This underscores that reaccredita-tion might improve some aspects, but other domains require targeted intervention for enhanced outcomes. It's important to further expand upon these results with a more detailed discussion, considering other influencing factors, literature comparison, and suggesting future directions for the study.

AUTHOR CONTRIBUTION

The study was developed and designed by author 1 and author 2, who also performed the research, and gath-ered, categorized, and processed the data. Research resources were provided by author 3 and author 4 wrote the article's first and last drafts. The content and simi-larity index of the paper are the responsibility of all au-thors, who also critically assessed and approved the final text. All authors have critically reviewed and ap-proved the final draft and are responsible for the content and similarity index of the manuscript.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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